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Can Affluence Explain Public Attitudes towards Climate Change Mitigation Policies?

A Multilevel Analysis with Data from 27 EU Countries

Contents

Abstract

This study examines the hypothesis that prosperity is an important determinant of public attitudes towards climate change mitigation. The analysis focuses on attitudes towards climate change mitigation policies in 27 EU countries using Eurobarometer data from June 2011. In the analysis, a random intercept multilevel model is used to test the relative strength of different individual level and country level effects. The results support the hypothesis that a higher level of prosperity leads to more concern about the environment. This study shows that individual affluence is an important determinant of the level of individual support for climate change mitigation policy. Furthermore, the results indicate that individual prosperity has a stronger effect than the overall level of wealth in society.

1. Introduction

The problem of global warming as a result of anthropogenic emissions of greenhouse gases remains one of the unsolved environmental problems of our times. Despite numerous UN sponsored international conferences on the subject, a global framework to mitigate climate change has so far failed to emerge. Instead, individual countries have begun to adopt unilateral approaches or use regional level institutions to coordinate mitigation policies. Examples of unilateral mitigation policies include tax schemes like the Australian carbon tax, the Dutch coal tax, and the Climate Change Levy in the United Kingdom. The EU's emission trading scheme is a noteworthy example of a regional climate change mitigation policies instrument.

Most anthropogenic greenhouse gas emissions come from power plants and combustion engines used in public and private transport. Climate change mitigation policies will lead to radical changes in energy production and consumption. It will also notably impact on transportation technologies and behaviors. It is therefore important for any policymaker to consider public attitudes towards climate change mitigation policies in the implementation of national or international policies. This entails understanding what determines attitudes at the individual level and at the national level.

There are different and competing theoretical approaches to explaining public attitudes towards environmental policies. Certain scholars, such as Inglehart (1995), attribute the source of environmental concern to either one of two possible causes: (1) presence of "objective problems" in terms of environmental degradation, mostly in developing countries of the Global South, or (2) presence of pro-environmental "subjective values" as a result of the post-materialist value shift that can be found in affluent societies.

Other scholars have postulated that environmentalism is best understood in social psychological terms as a new globally applicable paradigm. This approach stresses the interconnection of humans with a fragile biosphere characterized by limited resources (Catton and Dunlap, 1978) and treats environmentalism as an emerging worldview. According to this so-called "new ecological paradigm", differences in national attitudes can be explained by an uneven and asynchronous adoption of the paradigm across different nations rather than by differences in wealth level.

Another theory explains differences in national attitudes on environmental policy as a collective phenomenon which is determined by the rational choices made by individuals in the context of their social situation. Under rational choice theory, individual attitudes towards environmental policy can be understood as the stated preference for the level of consumption of environmental quality as a public good. This stated preference is the result of a rational evaluation of competing choices under constraints. In particular, it is the outcome of maximizing the utility which the individual expects from allocating scarce resources between expenditures on environmental protection and expenditures for alternative goods. One important finding that scholars such as Diekmann and Franzen (1999) have shown using rational choice theory is that the level of wealth is positively associated with environmental concern.

Apparently, there is no agreement in the literature on the role of prosperity as an explanation for attitudes towards environmental policy. While some scholars argue that individual affluence and national wealth determine attitudes towards climate change mitigation policies (be it through rational choice mechanisms or through a wealth-induced shift in values), others place less emphasis on wealth and propose alternative explanations.

The purpose of this study is to examine the hypothesis that prosperity is an important determinant of public attitudes to climate change mitigation. This study compares attitudes to climate change mitigation policies in 27 EU countries using survey data from Eurobarometer Survey No. 75.4, published

in June 2011. The survey contains data on the topic of climate change mitigation, including data on the support for taxation based on energy consumption. The study begins by analyzing the distribution of the support for climate change mitigation policies across different countries. It then applies a random intercept multilevel model to the data to test the relative strength of different individual level and country level effects.

The results confirm the hypothesis. This study is able to show that individual affluence is an important determinant of the level of individual support for climate change mitigation policies. Furthermore, the results indicate that individual prosperity has a more important effect than the overall level of wealth in society.

After this introduction, the next section explicates main competing theoretical approaches and reviews the evidence from earlier studies in this area. The third section describes the data sources and the methodology that has been applied. The fourth section presents the results from the statistical analysis. It includes descriptive statistics and the results from a multilevel model that includes individual and country level variables. After the findings are discussed and compared to evidence from prior research, the final section summarizes the main findings and concludes.

2. Explaining Differences in National Attitudes to Climate Change Mitigation Policies

There are (at least) three different theoretical approaches to explain differences in national attitudes towards environmental policy issues such as climate change mitigation. These competing approaches are the post-materialist value theory, the new ecological paradigm and rational choice theory.

Ronald Inglehart (1990) formulated the post-materialist value theory and applied this theoretical approach to explain environmental concern. At the heart of the theory lies the idea that there is a shift in individual values when the most basic needs (such as food, shelter, security from economic deprivation) are secured. Individuals in affluent countries become pre-occupied with post-material goals such as political freedom or environmental protection. Inglehart argues that part of the post-World War II-born population in the United States and Europe have experienced this value shift because of the secure economic conditions in the post-war booming years. In his view, this value shift explained the advent of environmentalism in the Western world.

The post-materialist value theory has initially developed as an explanation of the emergence of environmentalism in affluent societies. However, by the 1990s it had become apparent that poorer countries of the Global South show similar levels of environmental concern as advanced countries (Dunlap et al., 1993). Not surprisingly, the post-materialist value theory is challenged by researchers such as Dunlap et al. (1993), and Brechin and Kempton (1994). Citing the inadequacy of the post-materialist value approach, these scholars explain environmentalism as a global phenomenon independent of wealth level. In particular, they show that environmental concern is higher in poorer countries. They explain this finding by arguing that there has been a new global paradigm. This so called "new ecological paradigm" (NEP) is defined as the emergent consciousness for the interconnection of humans with a fragile biosphere characterized by limited resources (Catton and Dunlap, 1978). Later publications argue that the NEP became a world-wide phenomenon as more and more societies adopted the paradigm over time, regardless of the level of prosperity (Dunlap and York, 2008; Dunlap and Van Liere, 2008).

Inglehart (1995) responded to the apparent shortcoming of the post-materialist approach by amending the original theory. He added an "objective problems" hypothesis, which attributes environmental concern to objective problems with environmental degradation in poorer countries. This additional hypothesis expands the original theoretical construct to cover the presence of environmentalism not only in affluent societies (via the subjective, post-materialist value shift) but also in poor societies (via the presence of objective problems of environmental degradation).

Other scholars (e.g. Diekmann and Franzen, 1999; Franzen and Meyer, 2010) use rational choice theory to explain attitudes regarding environmental quality. Under rational choice theory, national attitudes on environmental policy can be understood as a collective phenomenon which is determined by rational choices made by individuals in the context of their social situation. Rational individual actors are the starting point for any analysis using rational choice theory. The actor chooses from a set of alternative actions according to a decision rule. The connection between individual choice and collective outcome is based on the so-called "macro-micro-macro model". Under this model, explanations of collective phenomena consist of three steps (Liebe and Preisendörfer, 2010):

1) "Macro-to-micro transition", which means that the environmental and social conditions affect the individual by influencing preferences and setting constraints.
2) "Purposive action-formation", which means that individuals generate a specific action, given their preferences, options available, and constraints.

3) "Micro-to-macro transition" in which individual actions and interactions generate a macro-level phenomenon.

The macro-micro-macro model is useful as a framework for explaining collective outcomes such as public support for environmental policies (Liebe and Preisendörfer, 2010). The state of the environment, wealth, and other social conditions are just a few macro factors which influence preferences and constraints. The most common action-formation mechanism in rational choice theory is subjectively expected utility maximization under budget constraints (Coleman and Fararo, 1992; Diekmann and Voss, 2004). The quality of the environment can be assumed to be a public good. Every individual has a budget of limited resources (e.g. income, time). These scarce resources can be divided into efforts to protect the environment and consumption of other goods. An individual decides whether or not to protect the environment by considering the utility which he or she can (subjectively) expect as the outcome of that choice. A rational individual then applies the decision rule: to select the option under which subjectively expected utility is maximized. The aggregated choices by a group of individuals create the collective effect. In terms of establishing the national level support for climate change mitigation policies, the aggregation is simply the sum of all individual attitudes across the population.

According to Diekmann and Preisendörfer (2003), rational choice theory explains environmental behavior better in high-cost situations than in low-cost ones. This proposition is called the low-cost hypothesis and has been verified as a valid proposition in a number of studies applying rational choice theory (Liebe and Preisendörfer, 2010). Climate change mitigation will affect energy production and transport behaviors. Switching to renewable energy sources and new transportation technologies is highly costly. Therefore, the application of rational choice theory is appropriate for the purpose of this study.

There are a number of important insights from the application of rational choice theory to environmental policy (Cropper and Oates, 1992). As has already been stated above, environmental quality is a public good which is non-excludable and non-rivalrous in consumption. It is also a normal good, for which demand rises along with income. As an individual's income rises, demand for all goods, including environmental protection such as climate change mitigation policies, rises as well. This relationship can be summarized as the prosperity hypothesis (Franzen and Meyer, 2010), which states that the level of environmental protection rises with increasing wealth, both at the individual and the aggregate levels.

In literature, there is mixed evidence for the validity of the prosperity hypothesis. Dietz et al. (1998) and Stern et al. (1999) emphasize the importance of values at the expense of social structural effects at the individual level, such as personal income. Others (e.g. Diekmann and Franzen, 1999; Franzen, 2003; Franzen and Meyer, 2010; Franzen and Vogl, 2013) find that wealth and environmental concern are positively associated. There are also studies that show the opposite, demonstrating that developing countries show higher levels of concern than developed countries (Dunlap and York, 2008; Brechin and Bhandari, 2011).

Given the debate over the validity of the prosperity hypothesis, more research in this area is clearly needed. The post-materialist approach and the rational choice theory both see wealth as a determining factor to explain attitudes to climate change mitigation policies. They differ on the mechanisms but do not contradict each other. The new ecological paradigm theory, by contrast, refutes the notion that wealth is important in explaining environmental attitudes.

3. Data Sources and Methodology

In the following sections, this study tests the prosperity hypothesis using survey data. It analyzes Eurobarometer data from 2011 using a mixed effects logistic regression model. The model allows an examination of the relationship between attitudes on climate change mitigation policies and affluence level, while controlling for individual- and country-level effects. The dataset consists of 26,840 observations from individuals in 27 EU member states.

The dependent variable is composed of the attitudes expressed by interviewees on the statement "taxation should be based on energy consumption". It is operationalized through a binary variable coded to 1 for moderate to strong support and 0 for moderate to strong opposition. It should be noted that the formulation of the question is quite general. Interviewees could assume that taxation for energy consumption would apply to individuals and corporations alike. This means that they might consider direct effects on personal expenditures due to taxation on their energy consumption and indirect effects via higher prices of energy intensive goods and services.

There are several reasons for using a multilevel model in the analysis of the determinants of attitudes to climate change mitigation policies. The Eurobarometer has a hierarchical structure with individuals in the 27 EU countries. Using a hierarchical model protects against bias in parameter estimates which results from group-level clustering in the data (Guo and Zhao, 2000). Multilevel models are able to estimate the effects of an individual predictor separately from its group-level mean, which are sometimes interpreted as "direct" and "contextual" effects of the predictor (Gelman, 2006). It has also been noted that such models generally outperform classical regression models in predictive accuracy, and provide protection against the "ecological fallacy" in which group-level correlations are mistakenly used to deduce individual-level correlations. In addition, multilevel models allow comparing effect sizes between effects on the lower level (individual) and the higher level (country) in the hierarchy.

The methodology in the following section is based on the approach described in Guo and Zhao (2000). The dependent variable is a binary response and will be observed as for individual i in country j. The probability of the response being equal to 1 will be modeled using the logit link function. Observations of the dependent variable are assumed to be Bernouille-distributed. There are n explanatory variables, which are included as fixed effects. The model is specified as a mixed effects model with the only random effect being the intercept for observations from any country j. The model can be written as:

$$\log\left[p_{ij}/(1-p_{ij})\right] = \beta_{0j} + \beta_1 x_{1ij} + \cdots + \beta_n x_{nij} + \varepsilon_{ij} \qquad (1)$$

$$\beta_{0j} = \beta_0 + \vartheta_j \qquad (2)$$

where ε_{ij} is the disturbance term at level 1 and where ϑ_j is the disturbance term at level 2. Errors are assumed to be normally distributed, with an expected mean of 0.

The dependent variable is expected to be determined by affluence, education, sex, age and whether a person lives in a rural or urban area. These are variables which have been identified in the literature as determinants for environmental concerns (see Gifford and Sussman, 2012, for a review of the evidence). Furthermore, individual attitude to climate change mitigation policies is expected to depend on per capita GDP and a measure of climate change risk. A country level variable measuring environmental quality will be added to test the explanation of variability due to the presence of an "objective problem" (see Inglehart, 1995). Finally, a variable for dependency on fossil fuels is added to

control for possible influences on public attitudes by activities of interest groups. Prior research has demonstrated that media communication of interest groups has a significant effect on public attitudes to climate change (Antilla, 2005; Boykoff & Boykoff, 2004).

Affluence is operationalized as a binary variable of answers to the questions whether an interviewee has difficulty paying bills each month. Unfortunately, Eurobarometer does not include a direct question on income, so the ability to pay bills regularly is used as an alternative measure for the financial situation of an individual. This is somewhat unfortunate because a binary variable does not allow one to study incremental effects of income across different income levels. On the other hand, some individuals may have a low income (in terms of a stream of earnings) but can nonetheless be wealthy (in terms of possessing a high stock of savings, possibly stored in an asset class with a lower liquidity than money). In this case, measuring the ability to meet expenditures captures affluence in terms of income and savings rather than just a direct measure of income.

Education is measured by 7 levels of schooling, using codes for schooling defined by the 1997 International Standard Classification of Education (ISCED) classification system. The variable takes values from 0 to 6. Level 6 is the highest degree of education (secondary education at doctoral level and beyond), and 0 is the lowest degree. Each level corresponds to 3-4 years of additional education. Education has been reported to have a positive effect on environmental concern (Gifford and Sussman, 2012; Franzen and Vogel, 2013).

Prior studies (Hunter et al., 2004; Franzen and Meyer, 2010) have found higher environmental concern among women and younger persons. The model therefore includes sex (coded to 1 for women and 0 for men) and also the interviewee's age as independent variables. The age variable will show a combined age and cohort effect. However, due to the cross-sectional nature of the data, it will not be possible to separate between the two.

Finally, the model includes the possible effect of living in a rural area as a determinant at the individual level. This measure may be important because urban populations could be more aware of climate change than rural populations. Also, individuals from more densely populated areas may be exposed to higher environmental degradation and could therefore exhibit higher concern about the environment.

Country-level variables include per capita GDP in 2011 expressed in 1,000 US$, in order to estimate variation affected by the general level of national prosperity. Data for this variable comes from the World Bank International Comparison Program database.

In addition to national wealth, the model includes the German-Watch Climate Risk Index. This index is constructed from the occurrence of extreme weather events from 1992 to 2010. A higher score on the index is associated with higher losses from flooding, storms, and other events that can represent adverse effects of climate change. The model thus includes the effects of special types of environmental degradation which are particularly relevant to climate change.

As the last country level variable, a measure of dependency on fossil fuels is added. To this end, the share of energy generated from coal is included. Data for this variable is derived from the World Bank's World Development Indicator Database, which cites International Energy Agency as the data source. This variable is coded as coal's share in all inputs used to generate electricity in each EU-27 country. The umbrella term "coal" includes hard coal, brown coal, and peat - both as primary and derived fuels (e.g. patent fuel, coke oven coke, gas coke, coke oven gas, and blast furnace gas). Coal is the largest source of greenhouse gases in the world. A high share of coal in energy production will likely be associated

with the presence of interest groups that oppose climate change mitigation policies. Scholars such as Entman (1993) or Scheufele (1999) have developed theories on how interest groups use media effects to influence public attitudes. Prior research has demonstrated that media effects play an important role in determining public attitudes to climate change. In particular, the relatively low level of concern in the United States has been attributed to such media effects (Antilla, 2005; Boykoff & Boykoff, 2004).

4. Results and Discussion

Table 1 shows the distribution of the dependent variable and the distribution of responses in the survey data by country. The third column shows the percentage of interviewees who indicated support for taxation based on energy consumption as a climate change mitigation policy. On average, 35% indicate either strong or moderate support. The highest level of support can be observed in Cyprus (49%). The next highest levels are in Spain (48%), Denmark (45%) and Austria (43%). By contrast, the lowest level of support can be found in Poland, where only 21% of the responses are in favor. Slovakia (25%), Estonia (26%) and the Czech Republic (27%) show the next lowest results.

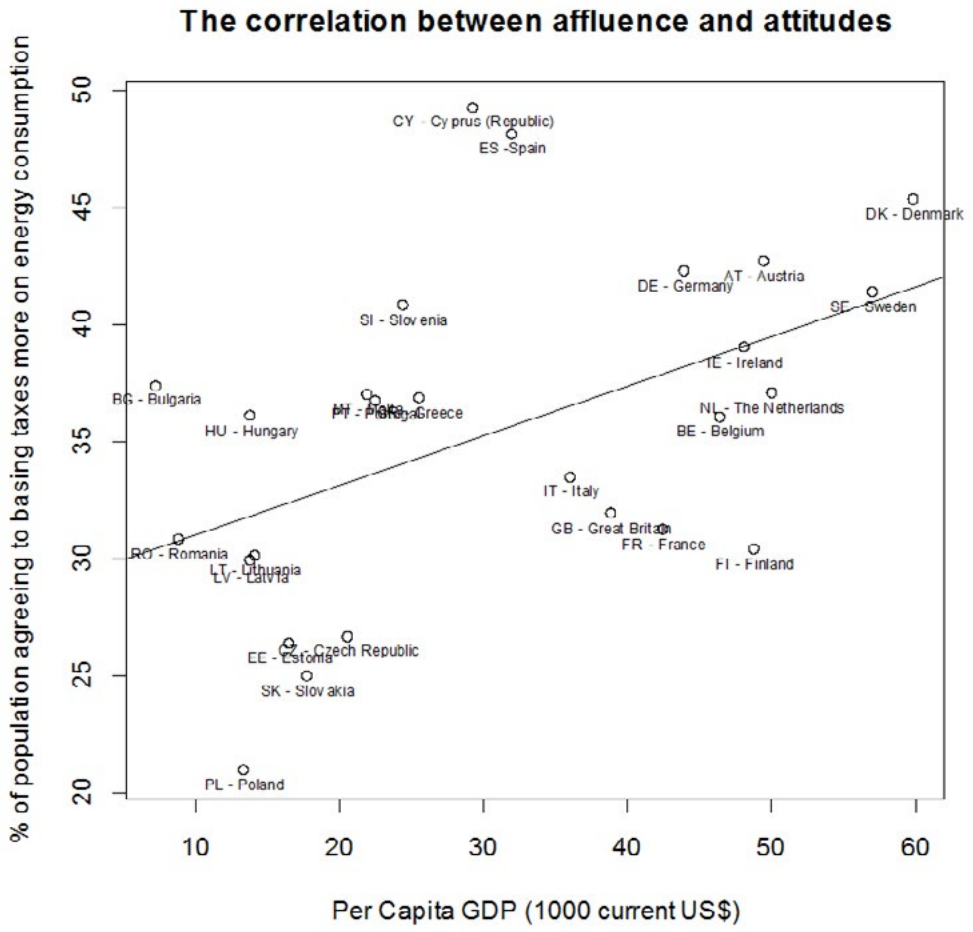
It is notable that citizens in EU states with lower per capita GDP exhibit lower levels of support for taxation based on energy consumption. This correlation is statistically significant in the Pearson test, with an estimate for the correlation coefficient of 0.481. The relationship is graphically displayed in Table 2. The result of a positive correlation between support for climate change mitigation policies and wealth level aligns with similar studies that show a positive correlation between environmental concern and wealth (see Diekmann and Franzen, 1999 and Franzen and Meyer, 2010 as examples). While these earlier studies compare countries across the world, this study is limited to the current 27 EU member states. It should be noted that the disparities in wealth are much larger on a global scale than within the EU. Despite this, the data from the EU shows a similar correlation as can be found in a more heterogeneous selection of cases on a global scale.

Table 1: Distribution of Dependent Variable and per Capita GDP

EU-27 Member State	Sample size	% of population in favor of basing taxation more on energy consumption	Per capita GDP, in current US$
CY - Cyprus (Republic)	504	49	$ 29,372
ES - Spain	1,004	48	$ 31,985
DK - Denmark	1,012	45	$ 59,889
AT - Austria	1,005	43	$ 49,581
DE - Germany	1,572	42	$ 44,021
SE - Sweden	1,019	41	$ 57,071
SI - Slovenia	1,019	41	$ 24,493
IE - Ireland	1,016	39	$ 48,249
LU - Luxembourg	507	37	$ 114,211
BG - Bulgaria	1,002	37	$ 7,287
NL - The Netherlands	1,001	37	$ 50,085
MT - Malta	500	37	$ 21,964
GR - Greece	1,000	37	$ 25,631
PT - Portugal	1,048	37	$ 22,504
HU - Hungary	1,004	36	$ 13,909
BE - Belgium	1,025	36	$ 46,513
IT - Italy	1,044	33	$ 36,104
GB - Great Britain	1,342	32	$ 38,961
FR - France	1,068	31	$ 42,522
RO - Romania	1,075	31	$ 8,874
FI - Finland	1,008	30	$ 48,843
LT - Lithuania	1,026	30	$ 14,148
LV - Latvia	1,019	30	$ 13,838
CZ - Czech Republic	1,019	27	$ 20,580
EE - Estonia	1,001	26	$ 16,534
SK - Slovakia	1,000	25	$ 17,795
PL - Poland	1,000	21	$ 13,382
EU-27		**35**	

1 Pearson correlation coefficient results for the EU-27 countries without Luxembourg, Data from 2011.

Table 2: Correlation between Affluence and Attitudes
(Data from 2011, EU-27 Countries without Luxembourg)



We now turn from the aggregate country level results to the individual attitudes and their covariants. Table 3 shows the results of fitting the multilevel model to the data. The model has been specified by combining equations (1) with (2) and substituting the dependent variable as follows:

$$\log\left[\frac{p_{ij}}{1-p_{ij}}\right] = \beta_0 + \beta_1 affluence_{ij} + \beta_2 education_{ij} + \beta_3 sex_{ij} + \beta_4 age_{ij} + \beta_5 rural_{ij} + \beta_6 pcGDP + \beta_7 climate\ risk\ score + \beta_8\ share\ of\ coal\ in\ energy\ generation + \vartheta_j + \varepsilon_{ij} \quad (3)$$

The distribution of age and education are plotted against the dependent variable to investigate effects of non-linearity. The data does not show any indication of a non-linear relationship.

Parameters are each tested for adding useful information (in terms of improving the model fit). The parameters are selected either for their usefulness or because they are of interest for investigating competing theories. In order to interpret effect sizes, the parameter estimates are converted into odds-ratios. Results are presented in Table 3.

The multilevel analysis shows that national attitudes to climate change mitigation policies depend on a variety of individual-level and country-level factors. The model for which the results are shown above is developed by comparing different model specifications. The explanatory power of different

model specifications is tested using the deviance statistic D by calculating the difference in the deviance statistic Ddiff = D Model of Interest – D Alternative Model, and using D as a likelihood ratio test statistic which has approximately a Chi square distribution (Guo and Zhao, 2000).

The model specified in (3) compares well against a null model consisting only of the country-specific random intercept, which means that fixed effects significantly improve model fit (the null model parameters are presented in a separate column in Table 3). Each individual fixed effect improves the model fit, although some do more significantly than others. In particular, per capita GDP is not useful in improving the model. The effect of per capita GDP is diminishingly small. Also, effect of the climate risk score variable is not robust to changes in the model specification. When other variables are left out, the effect ceases to be of statistical significance. However, these two variables are nonetheless of interest because they allow us to analyze the effect of national wealth and the presence of objective problems of environmental degradation. Therefore, they are retained in the final model specification. The other fixed effects show a significant and substantial improvement of the model.

Table 3: Determinants of Public Attitudes to Climate Change Mitigation Policies: Support for Taxation Based on Energy Consumption

Multilevel logit regression	Model with all data:			Null model:	
	Estimator	Std. errors	Odds ratios	Estimator	Std. errors
Constant	1.082***	0.254		0.836**	0.079
Individual level variables					
Affluence	0.209***	0.043	1.232		
Education	0.112***	0.108	1.118		
Sex (1=female)	-0.088**	0.027	0.916		
Age	-0.071***	0.001	0.993		
Rural	-0.070*	0.029	0.932		
Country level variables					
Per capita GDP	0.002	0.003	1.002		
Climate risk score	-0.003+	0.002	0.996		
Share of coal in electricity generation	-0.085**	0.003	0.992		
Number of observations	26,840			26,840	
Var (Constant): country level	0.16			0.16	
Groups	27			27	
LogLikelihood	-16135			-16285	
Deviance	32270			32569	

Signif. codes: 0 '***' / 0,001 '**' / 0,01 '*' / 0,05 '+'

Results from the analysis confirm the prosperity hypothesis. Individual affluence has a relatively large positive and significant effect. Holding other effects constant, falling into the category "affluent" increases the odds of supporting climate change mitigation policies by 23%. This result is predicted by the prosperity hypothesis and echoes similar results found in the literature (e.g. Kemmelmeier et al., 2002; Franzen and Meyer, 2010; Franzen and Vogel, 2013). The hypothesized effect of affluence at the national level does not

show a significant effect on the results. However, the 27 EU countries in this study have a much narrower variation in per capita GDP when compared with samples that include countries from all different regions in the world. This limitation may explain the absence of a country-level effect of affluence that has been found in other studies.

Besides affluence, education has a relatively large, positive and significant effect. Holding other effects constant, an additional level of education increases the odds of supporting climate change mitigation policies by 11.8%. This result has been expected, since education increases knowledge about the effects of climate change. This should then lead to higher levels of concern. The result confirms earlier research (Lyons and Breakwell, 1994; Eagles and Demare, 1999; Franzen and Meyer, 2010; Franzen and Vogel, 2013).

Contrary to expectation, the odds of women supporting climate change mitigation policies are only 91.6% of that of men. This finding contradicts earlier studies, which have found higher concern for the environment in women than in men (Hunter et al., 2004; Franzen and Meyer, 2010).

Age shows an expected negative effect (with the odds of supporting climate change mitigation policies being about 99.3% lower with every year of age difference). It should be noted that the effect combines cohort and age influences. Older respondents are members of age groups that have been socialized before the emergence of environmentalism. The results are therefore consistent with the idea that these cohorts show a lower concern for climate change than younger generations, who have grown up in a society where environmental issues are more prevalent. Furthermore, the results are consistent with the notion that older respondents are likely to be less concerned about climate change when it will occur beyond their life expectancy. Similar results have been reported in the literature (Gifford and Sussman, 2012).

Living in a rural community lowers the odds. The results show that living in a rural area lowers the odds to 93% of the odds of a person living in an urban area. One explanation for this observation has been frequently proposed in the literature: farmers and other rural residents exploit nature for their living, while urban residents tend to take the view that nature should be protected for its own sake (e.g. Van Liere and Dunlap, 1980). Supposedly, rural residents have a higher tolerance for environmental degradation resulting from exploitation of natural resources. However, evidence from the literature for this explanation is quite mixed (Gifford and Sussman, 2012). Also, several studies have found that conservative voters are more likely to be skeptical of climate change than progressive or liberal voters (Marquart-Pyatt et al., 2011). Since there are generally more progressive or liberal voters in urban areas, the lower support for climate change mitigation policies in rural areas can also be interpreted as an effect connected with the prevailing personal values and political orientation in this geographic category.

Including the climate risk index score in the model does not improve the model fit. The effect is neither large nor robust. The statistical significance of the effect depended on the presence of covariants. This implies that there is no evidence of an effect of an "objective problem". However, it is possible that the climate risk index, which is based on extreme weather events spanning a large time frame (1992-2011), does not capture the subjective risk perception of the individuals in the survey. Climate change is a rather abstract subject matter and it would certainly be better to include a direct measure of subjective risk perception in a future study, in order to test possible explanations for the large regional effect and the insignificant effect of including the climate risk index.

The evidence shows that support for climate change mitigation policies tends to be lower in countries where coal plays an important role in energy production. The share of coal in energy generation

shows a significant negative effect as a country level variable. An additional percent of coal in national electricity production lowers the odds by 0.08%. This finding points to the presence of interest groups like coal mining and power generation businesses which influence public attitudes on climate change mitigation.

5. Conclusion

Combating climate change requires households and businesses to adopt changes that are costly and inconvenient. In a democratic process, governments need to rely on public support to implement climate change mitigation policies. The results presented here contribute to the body of research that strives to explain differences in attitudes both at the individual level and at the national level.

The main contribution of this research is the test of the prosperity hypothesis. The evidence presented here reinforces results from prior research (e.g. Kemmelmeier et al., 2002; Franzen and Meyer, 2010) which confirm prosperity to be an important determinant of the level of environmental concern. First, this study presents evidence that the level of national wealth is positively correlated with support for climate change mitigation policies. Second, the results show that individual support of climate change mitigation policies is strongly dependent on individual affluence. Third, the results indicate that among countries on a similar level of development, individual prosperity has a stronger effect than the overall level of wealth in society.

One interesting result is that the share of coal in energy generation is negatively correlated with support for climate change mitigation policies. This finding would be explained by the presence of interest groups that influence public attitudes formation in order to build opposition to climate change mitigation policies. Climate change is neither an intuitive nor simple topic. One needs to understand the concept of emissions and greenhouse gas concentration in the atmosphere, distinguish between long-term trends (climate) and noise (everyday's weather), weigh the risks and benefits, and evaluate scientific uncertainty (Marquart-Pyatt et al., 2011). Given the complexity of the subject, it seems plausible that the public would rely on the media when forming attitudes. Furthermore, research on climate change skepticism has been able to attribute the relatively high levels of skepticism in the USA to such media effects (Antilla, 2005; Boykoff & Boykoff, 2004). Therefore, this hypothesis appears to be a sensible starting point for further research.

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